The metabolism of methanogenic bacteria in particular received a great deal of attention and Zeikus' authoritative summary of C_1 metabolism in methanogens and acetogens reflects his involvement in the field. Details of energy metabolism and biosynthesis in both groups are yet to be elucidated but the pathway of carbon fixation in methanogens seems to be established as being quite different from those of aerobic carbon antotrophs. One feels that aided by the development of genetic systems for these strict anaerobes progress in this area will be rapid and rewarding.

In summary, the latest volume ensures that Advances in Microbial Physiology will continue to be one of the key references series used for teaching and research in microbial physiology and biochemistry.

John Robinson

The Target of Penicillin

The Murein Sacculus of Bacterial Cell Walls

Architecture and Growth

Edited by R. Hakenbeck, J.V. Höltje and H. Labischinski

Walter de Gruyter; Berlin, New York, 1983
xxvii + 663 pages. DM 180.00

This substantial book is based on the Proceedings of an International FEMS Symposium held in March 1983 in West Berlin. It aims to bring together current views of the structure, function and biosynthesis of the characteristic peptidoglycan sacculus of bacterial cell walls. The ability of β-lactam antibiotics to inhibit late states of murein formation and to trigger subsequent enzymic degradation of the sacculus enabled the book to be given an eye-catching title.

A brief but authoritative introduction describes the development of research on bacterial cell walls and its integration with studies of the mode of action of lysozyme and penicillin. This is followed by 97 articles, placed in six groups, which should persuade the reader that the Symposium achieved its aim.

Although the primary structure of murein is known its molecular architecture is not. Two opening sections of the book deal with attempts to formulate three-dimensional models which would account for both the rigidity and flexibility of the sacculus and for its growth in such a way that a bacterium acquires and retains a characteristic shape. Subsequent articles are concerned with biological properties of murein, with the function and control of murein hydrolases, and with the role of these enzymes in the antibacterial effects of antibiotics that inhibit murein synthesis. Penicillin-binding proteins in the cell membrane, the primary targets of the β-lactam antibiotics, are the subjects of a further series of contributions, which describe attempts to relate these proteins to specific enzymes on which murein formation depends. Various aspects of the biosynthesis of murein are brought together in the final section of the book.

The book has useful subject and author indexes and the individual contributions, necessarily brief in themselves, give lists of references to more detailed papers. No one is likely to read it all at a single sitting. But it is a useful guide to present knowledge of the important murein component of bacterial envelopes. It describes experimental findings and the potential value of new techniques side-by-side with hypotheses relating to some of the many questions which still require an answer.

E.P. Abraham